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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,704	03/19/2004	Dongtai Liu	VLC08860US	7510
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/804,704	Applicant(s) LIU, DONGTAI
	Examiner Rahel Guarino	Art Unit 2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-7,9-13 is/are rejected.
- 7) Claim(s) 8 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 19 March 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-166/08)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over May US 6,100,717 in view of Takato et al. US 5,402,485

Re claim 1, May discloses A DSL line interface unit for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line (fig.3), the DSL line interface unit comprising: a differential line driver (fig.3 (200)) including a first amplifier (fig.3 (202)) and a second amplifier (fig.3 (204)) for amplifying the DSL transmit signal (V_{inP} , V_{inN}); does not teach a first complex termination module coupled to an output of the first amplifier; a second complex termination module coupled to an output of the second amplifier; a transformer including a primary winding coupled to the transmission line and a secondary winding coupled to the first complex termination module and to the second

complex termination module; and an impedance synthesizer module coupled to the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier.

However, Takato teaches a first complex termination module (54) coupled to an output of the first amplifier (21); a second complex termination module (53) coupled to an output of the second amplifier (33); a transformer (fig.1 (TR)) including a primary winding coupled to the transmission line (fig.1 (Tx)) and a secondary winding coupled to the first complex termination module and to the second complex termination module (col. 10 lines 25-30); and an impedance synthesizer module coupled to the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier (col.11 lines 27-30).

Therefore, taking the combined teaching of Takato and May as a whole would have been rendered obvious to one skilled in the art to modify May to utilize a first complex termination, a second complex termination, an impedance synthesizer, transformer for the benefit of improving the frequency characteristic over the transmission line.

Re claim 2, the modified invention as claimed in claim 1, wherein the first amplifier (fig.6 (402)) includes a first positive input terminal (fig.6 (406)) and a first negative input terminal and the second amplifier (fig.6 (404)) includes a second positive input terminal (fig.6 (408)) and a second negative input terminal (col. 5 lines 9-18, " May"), and the impedance synthesizer module is coupled to the first negative input terminal and the second negative input terminal to provide the negative feedback

(Col.5 lines 25-27," May").

Re claim 3, the modified invention as claimed in claim 2, wherein the differential line driver further includes (fig.6 (400)," May"):

a first resistor (fig.6 (412a)) coupled between the output of the first amplifier (fig.6 (402)) and the first negative input terminal and a second resistor (fig.6 (412b)) coupled between the output of the second amplifier (fig.6 (404)) and the second negative input terminal (col. 7 lines 17-23," May").

Re claim 4, the modified invention as claimed in claim 2, wherein both the first amplifier (fig.3 (202)) and the second amplifier (fig.3 (204)) are operational amplifiers (abstract," May").

Re claim 5, the modified invention as claimed in claim 1, wherein:
the first complex termination module (fig.16 (51)) includes a first resistor and a first capacitor coupled to the first resistor in parallel; and the second complex termination module (fig.16 (52)) includes a second resistor and a second capacitor coupled to the second resistor in parallel (col. 10 lines 25-32," Takato").

Re claim 6, the modified invention as claimed in claim 1, wherein:
the first complex termination module (fig.16 (51)) includes a first resistor and a first capacitor coupled to the first resistor in parallel; and the second complex termination module (fig.16 (52)) includes a second resistor and a second capacitor coupled to the second resistor in parallel (col. 10 lines 25-32," Takato").

3. Claims 7,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over May US 6,100,717 in view of Takato et al. US 5,402,485 in further view of Ballatore et al. US 4,538,032

Re claim 7, the modified invention as claimed in claim 1, does not teach where the impedance synthesizer; a first resistor being coupled between center taps of the secondary winding of the transformer and having a first end and a second end of the second resistor, a second resistor coupled between the first end of the first resistor and a negative input terminal of the first amplifier; a third resistor coupled between the second end of the first resistor and a negative input terminal of the second amplifier.

However, Ballatore discloses where the impedance synthesizer; a first resistor (R_{24}) being coupled between center taps of the secondary winding of the transformer (winding (K)) and having a first end and a second end (col. 7 lines 25-38), the second resistor (R_{26}), coupled between the first end of the first resistor and a negative input terminal of the first amplifier (negative input of amplifier A4, (col. 7 lines 25-38), and the third resistor (R_{19}) coupled between the second end of the first resistor and a negative input terminal of the second amplifier (col. 7 lines 25-38, also see figure 5 where it is shown the negative input of amplifier).

Therefore, taking the combined teaching of Ballatore, Takato and May as a whole would have been rendered obvious to one skilled in the art to modify Takato and May to utilize a first resistor being coupled between center taps of the secondary winding of the transformer and having a first end and a second end of the second

resistor, a second resistor coupled between the first end of the first resistor and a negative input terminal of the first amplifier; a third resistor coupled between the second end of the first resistor and a negative input terminal of the second amplifier for the benefit of adaptively adjusting the impedance including measuring the current variations in a two-wire line circuit.

Re claim 9, May discloses a DSL line interface unit for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface unit comprising (fig.3),:
a differential line driver (fig.3 (200)) including a first amplifier (fig.3 (202)) and a second amplifier (fig.3 (204)) for amplifying the DSL transmit signal (V_{inp} , V_{inn}); does not teach a first complex termination module coupled to an output of the first amplifier; a second complex termination module coupled to an output of the second amplifier; a transformer including a primary winding coupled to the transmission line and a secondary winding coupled to the first complex termination module and to the second complex termination module and an impedance synthesizer module a first resistor a second resistor a third resistor coupled to the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier.

However, Takato teaches a first complex termination module (54) coupled to an output of the first amplifier (21); a second complex termination module (53) coupled to an output of the second amplifier (33); a transformer (fig.1 (TR)) including a primary winding coupled to the transmission line (fig.1 (Tx)) and a secondary winding coupled to the first complex termination module and to the second complex termination module

(col. 10 lines 25-30); and an impedance synthesizer module a first resistor (R_{111}), a second resistor (R_{112}), a third resistor (R_{113}), coupled to the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier (col.11 lines 27-30).

The modified invention of May and Takato does not teach the first resistor being coupled between center taps of the secondary winding of the transformer and having a first end and a second end, the second resistor, coupled between the first end of the first resistor and a negative input terminal of the first amplifier negative input of amplifier, and the second resistor coupled between the second end of the first resistor and a negative input terminal of the second amplifier, the first resistor detecting a voltage between the center taps of the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier via the second resistor and the third resistor, respectively.

However, Ballatore teaches (fig.5) the first resistor (R_{24}) being coupled between center taps of the secondary winding of the transformer (winding (K)) and having a first end and a second end (col. 7 lines 25-38), the second resistor (R_{26}), coupled between the first end of the first resistor and a negative input terminal of the first amplifier (negative input of amplifier A4, (col. 7 lines 25-38), and the second resistor coupled between the second end of the first resistor and a negative input terminal of the second amplifier (col. 7 lines 25-38, also see figure 5 where it is shown the negative input of amplifier), the first resistor detecting a voltage between the center taps of the secondary winding of the transformer and providing negative feedback to the first

amplifier and the second amplifier via the second resistor and the third resistor, respectively (col. 7 lines 15-20).

Therefore, taking the combined teaching of Takato and May as a whole would have been rendered obvious to one skilled in the art to modify May to utilize a first complex termination, a second complex termination, an impedance synthesizer, transformer for the benefit of improving the frequency characteristic over the transmission line.

4. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Melsa et al. US 2004/0001586 in view of Stephens US 6,144,721

Re claim 10, Melsa discloses a DSL line interface for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface comprising:
amplification means for amplifying the DSL transmit signal (para#003 lines 1-4);
detection (peak detector (210)) means coupled to the amplification means for detecting a voltage corresponding to the DSL receive signal (para#26 lines 4-16); does not teach isolation means coupled between the detection means and the transmission line for electrically isolating the amplification means and the detection means from the transmission line; and feedback means coupled between the amplification means and the isolation means for providing negative feedback to the first amplifier and the second amplifier.

However, Stephens discloses isolation means coupled between the detection means (fig.9 (CD2)) and the transmission line for electrically isolating the amplification means and the detection means from the transmission line (col. 11 lines 1-11); and feedback means coupled between the amplification means and the isolation means for providing negative feedback to the first amplifier and the second amplifier (col. 19 lines 21-29).

Therefore, taking the combined teaching of Stephens and Melsa as a whole would have been rendered obvious to one skilled in the art to modify Melsa to electrically isolate the amplification and provide negative feedback to the first amplifier and the second amplifier for the benefit of eliminating power consumption (power saving mode).

Re claim 11, the modified invention as claimed in claim 10, wherein the feedback means detects current flowing through the isolation means and provides a feedback signal corresponding to the detected current to the amplification means to provide the negative feedback (col. 13 lines 6-16, "Stephens").

Re claim 12, the modified invention as claimed in claim 10, wherein the detection means includes at least a resistor means and a capacitor means coupled to the resistor means in parallel (col. 11 lines 1-11, "Stephens").

Re claim 13, the modified invention as claimed in claim 10, wherein the amplification means differentially amplifies the DSL transmit signal (col. 17 lines 30-34).

Allowable Subject Matter

5. Claim 8 is allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rahel Guarino whose telephone number is (571)270-1198. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Payne David can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RG

/Kevin M. Burd/
Primary Examiner, Art Unit 2611